

NASA's Space Launch System: Momentum Builds Towards First Launch

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Space Launch System

The Journey to Mars



EARTH RELIANT

MISSION: 6 TO 12 MONTHS
RETURN TO EARTH: HOURS



Mastering fundamentals
aboard the International
Space Station

U.S. companies
provide access to
low-Earth orbit

PROVING GROUND

MISSION: 1 TO 12 MONTHS
RETURN TO EARTH: DAYS



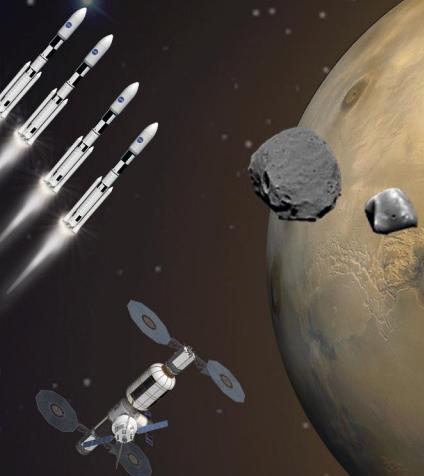
Expanding capabilities by
visiting an asteroid redirected
to a lunar distant retrograde orbit

The next step: traveling beyond low-Earth
orbit with the Space Launch System
rocket and Orion spacecraft



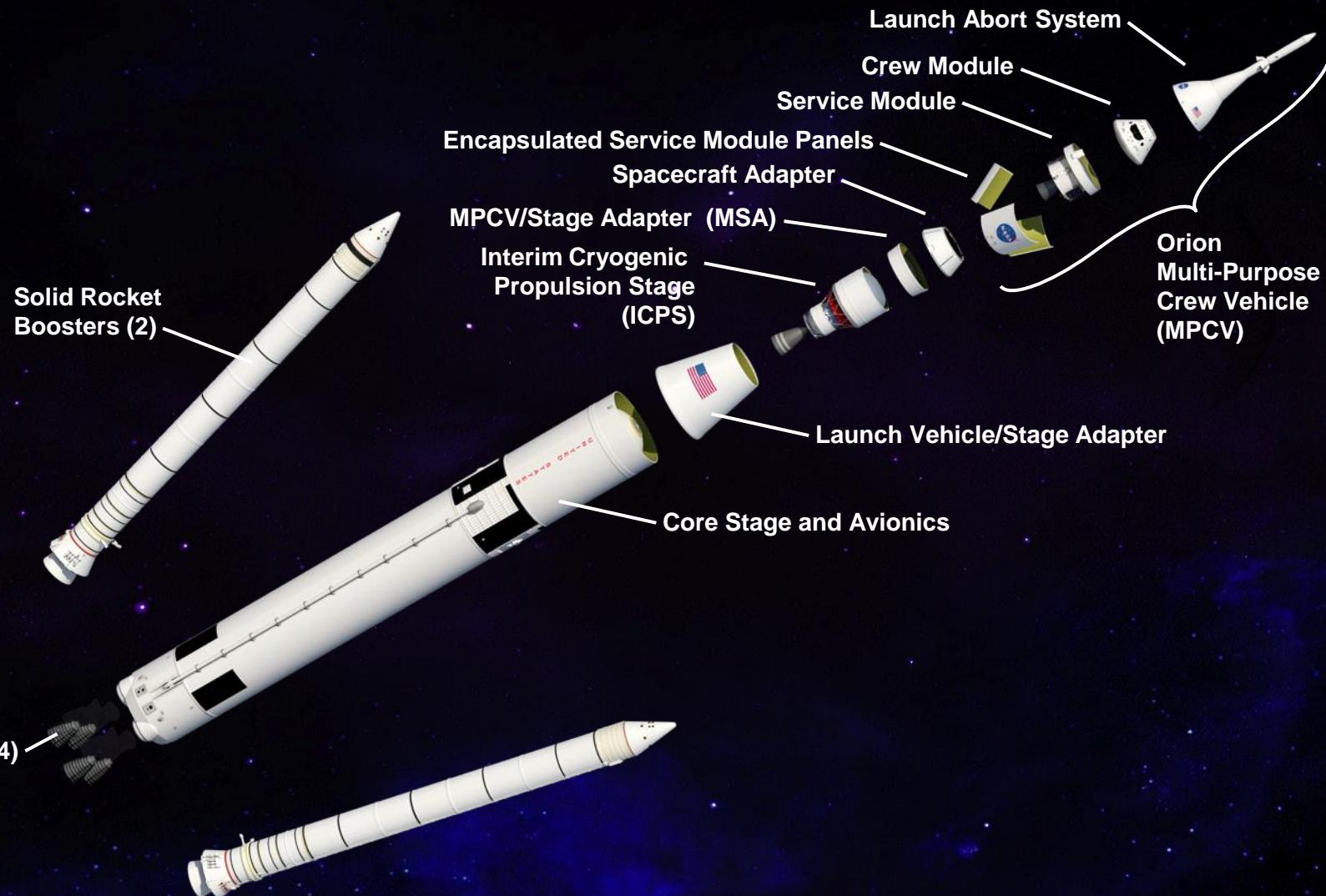
MARS READY

MISSION: 2 TO 3 YEARS
RETURN TO EARTH: MONTHS

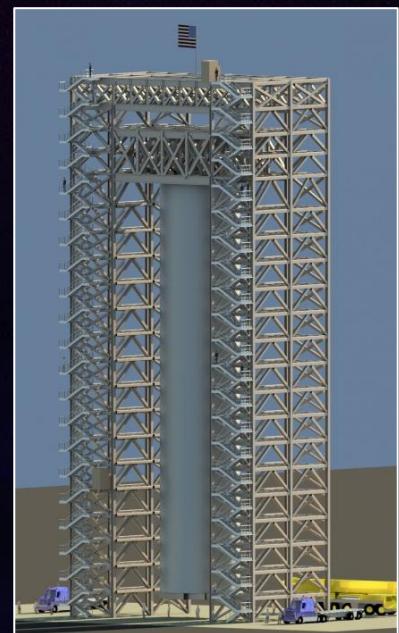
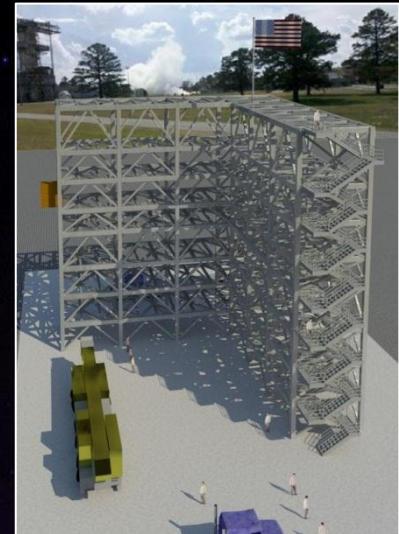
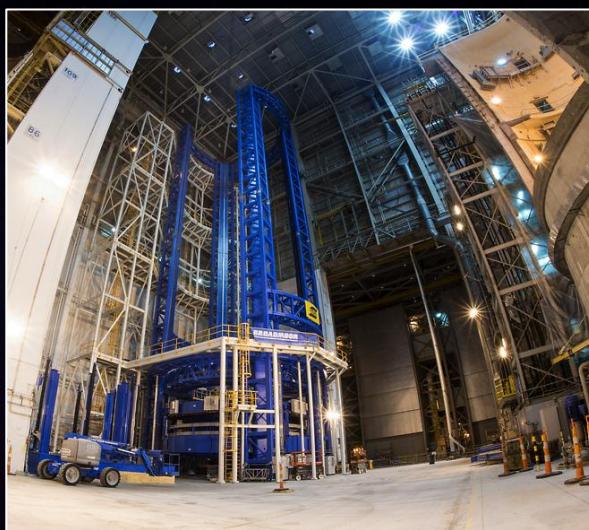


Developing planetary independence
by exploring Mars, its moons and
other deep space destinations

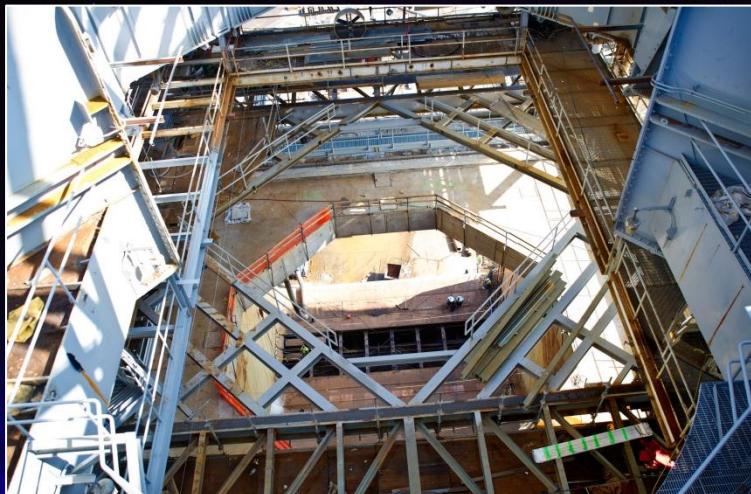
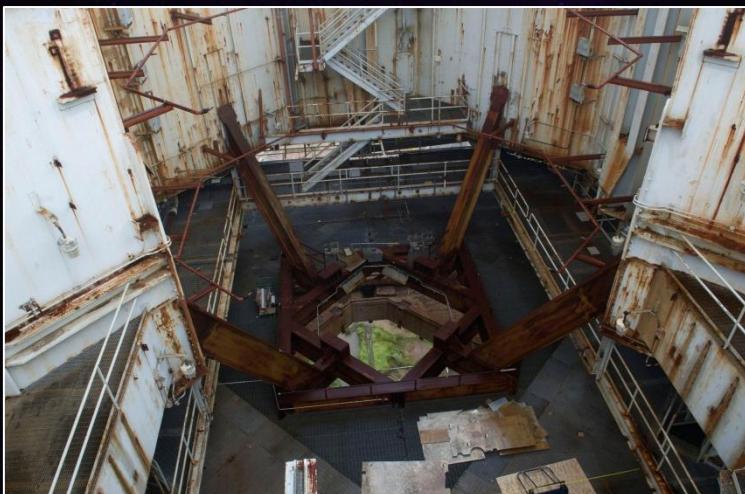
SLS Block 1 70t vehicle



Payload Adapter, Stages



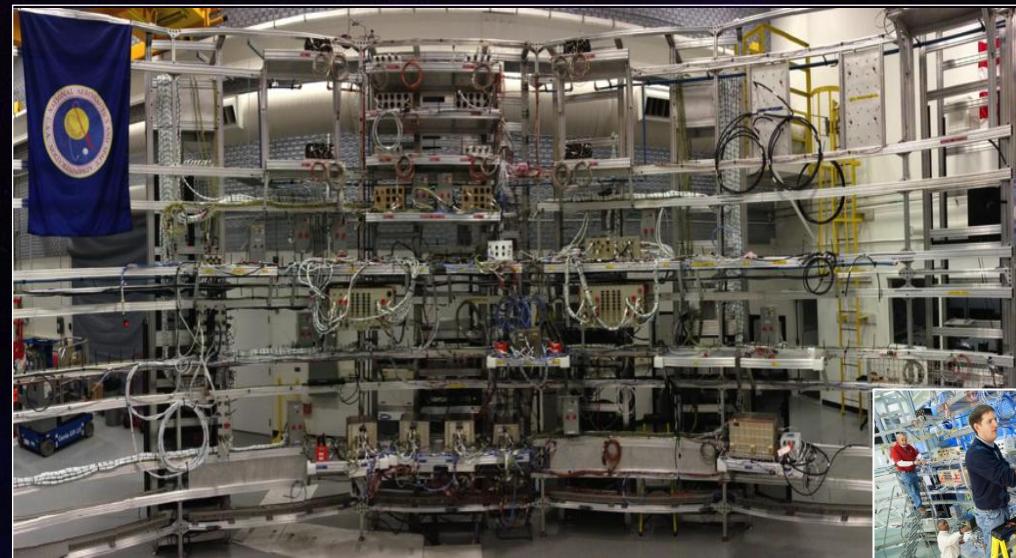
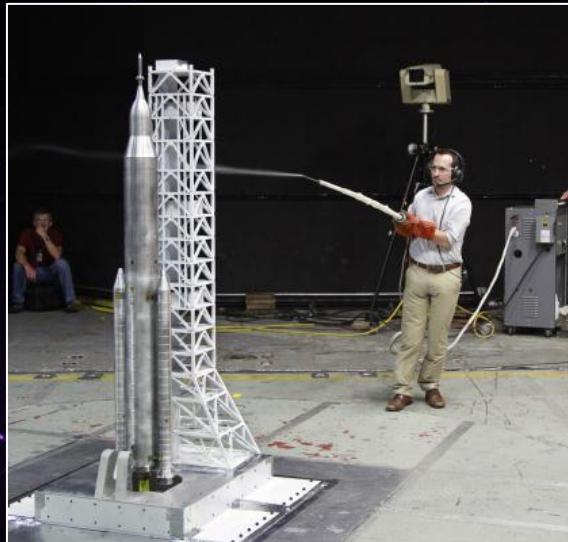
RS-25 Engine, Stage Testing



Solid Rocket Boosters



Systems Engineering and Integration



SLS Milestones Schedule



2011	2012	2013	2014	2015	2016	2017–18
MCR	SRR/SDR	PDR	KDP-C CDR		SIR FRR	EM-1 FRR Launch Availability
<i>Formulation</i>				<i>Implementation</i>		
SLS Design Chosen	Engines Delivered to Inventory	Manufacturing Tooling Installation	Production of First New Flight Hardware	Main Engine Test-Firing	Core Stage Structure Testing	Vehicle Stacking at KSC
Booster Development Test	Wind Tunnel Testing	ICPS Production Begins	Orion Flight Test	Core Stage Assembly	Booster Assembly at KSC	Internal Launch Readiness
Concept Studies	Concept & Technology Development	Preliminary Design & Technology Completion	Final Design & Fabrication	System Assembly, Integration & Test, Launch & Checkout		

MCR: Mission Concept Review

CDR: Critical Design Review

SRR: System Requirements Review

SIR: System Integration Review

SDR: System Definition Review

FRR: Flight Readiness Review

PDR: Preliminary Design Review

PLAR: Post-Launch Asses. Review

Rolling Toward First Launch



BACKUP



Revolutionary Evolution



Orion

Interim Cryogenic
Propulsion Stage

Five-Segment Solid
Rocket Boosters

Block I
70 metric tons



Core Stage

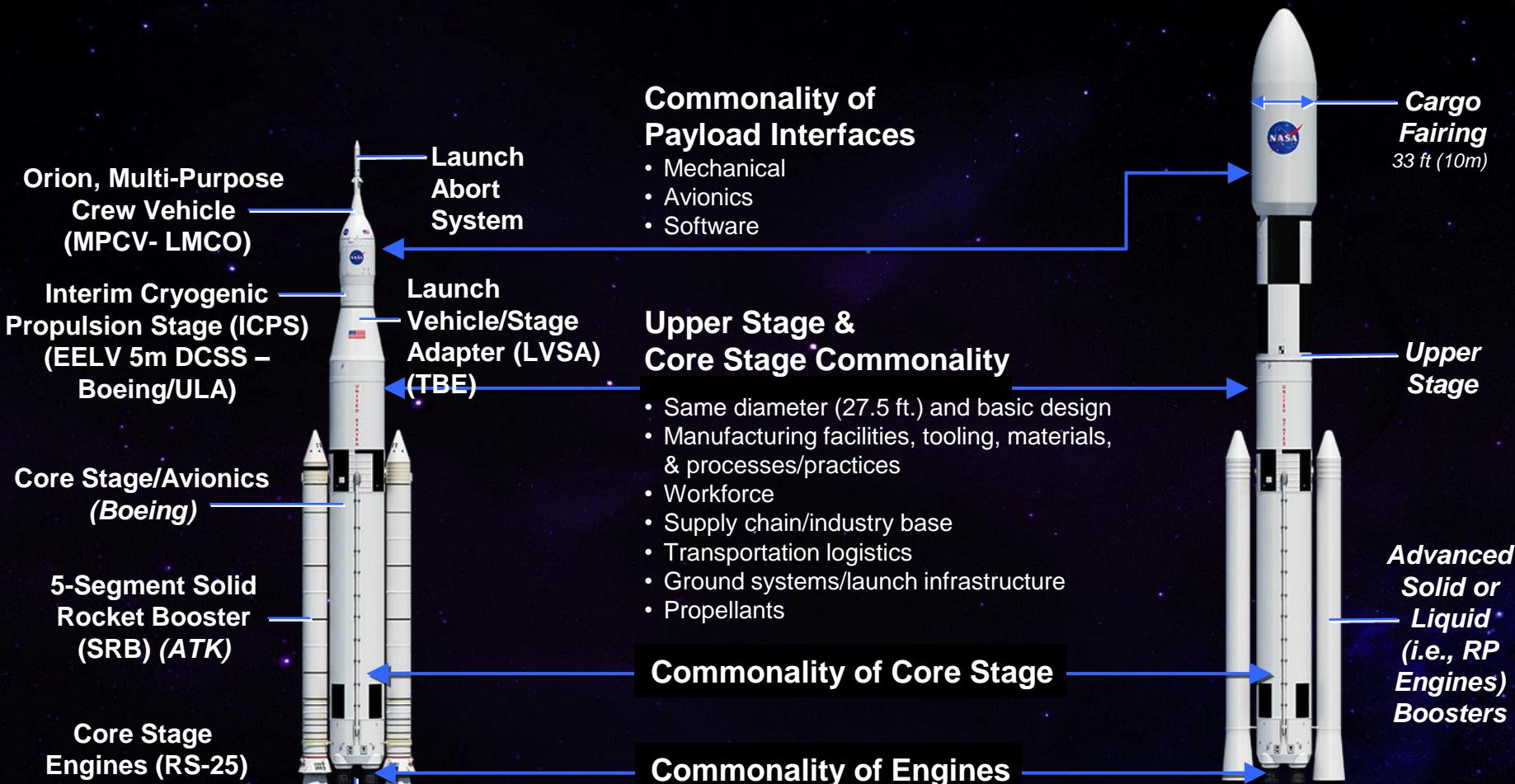


Upper Stage

Liquid or Solid
Advanced Boosters

Block II
130 metric tons

Evolving Capability



Evolutionary Path to Future Capabilities

- Minimizes unique configurations
- Allows incremental development

Block 2 Capability
130 metric ton
Payload

EM-1 Mission Overview: Uncrewed Distant Retrograde Orbit



Total Mission Duration: 25-26 days

